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L3: Entry 2 of 4

File: DWPI

Jul 10, 1991

DERWENT-ACC-NO: 1991-243740
DERWENT-WEEK: 199133
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TITLE: Semiconductor for trench isolation - produced by depositing tetra:ethyl
orthosilicate film by CVD

PATENT-ASSIGNEE:

ASSIGNEE	CODE
ANONYMOUS	ANON

PRIORITY-DATA: 1991RD-0327019 (June 20, 1991)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
RD <u>327019</u> A	July 10, 1991		000	

INT-CL (IPC): H01L 0/01

ABSTRACTED-PUB-NO: RD 327019A
BASIC-ABSTRACT:

Process for depositing tetraethylorthosilicate (TEOS) oxide films which are of good quality suitable for trench isolation is as follows: Using conventional CVD equipment, a film is deposited with TEOS/O3/O2 gases at 50 Torr pressure and 400 degrees C. This step is followed by a rapid thermal anneal process (RTP) using a system capable of annealing up to 1150 degrees C. When a film about 300-400nm thick is deposited with TEOS/ozone and annealed in a RTP system for 30 seconds at 800-1150 degrees C in Ar ambient or (N2, O2), densification and stress reduction results. The thermal CVD TEOS/RTP process is repeated until the desired film thickness is achieved. RTP annealing reduces the film thickness range from 6 to 12% in the temperature range cited.

USE/ADVANTAGE - Thermal chemical vapour deposition (CVD) of TEOS/O3 films show excellent conformality and good trench fill properties up to 1.3 aspect ratio; however, they tend to have cracks and defects when thick (more than 700nm) films are deposited. By this process, thick films of 1.26 micron can be deposited without defects or cracking. Densified TEOS oxide etch rates will decrease with increased annealing temperatures and are comparable to LPCVD TEOS oxide deposited films. Useful in semiconductor mfr.

TITLE-TERMS: SEMICONDUCTOR TRENCH ISOLATE PRODUCE DEPOSIT TETRA ETHYL ORTHOSILICATE
FILM CVD

DERWENT-CLASS: L03 U11

CPI-CODES: L04-C12A; L04-C12C; L04-C16;

EPI-CODES: U11-C05B2; U11-C05B7; U11-C05B9; U11-C08A3;

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C1991-105973
Non-CPI Secondary Accession Numbers: N1991-185800

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